

SHOCK Cardiovascular measurements were obtained in 100 surgical patients in various types and stages of shock. In hemorrhagic shock, low cardiac output was associated with diminished central blood volume, diminished total blood volume, and low central venous pressure. Relatively normal cardiac output was observed in the group with hemorrhage plus trauma, and secondary sepsis. Circulatory response to volume loading was compared to that with stimulation by sympathomimetic amines. Marked hemodynamic improvement was observed in over half of the severely shocked patients after administration of plasma expanders, especially dextran-40. Only about one-fourth of these patients demonstrated the greatest response to sympathomimetic amines; usually isoproterenol was more effective than vasopressors. (Shoemaker, W. C., and Baker, R. J.: *Evaluation and Treatment of the Patient in Shock from Trauma*, Surg. Clin. N. Amer. 47: 3 (Feb.) 1967.)

BLOOD PRESSURE IN SHOCK Arterial pressure was considerably higher than the cuff pressure obtained by auscultation or palpation of the brachial artery in 18 patients with shock and high total peripheral vascular resistance. Pulse pressure was also greatly underestimated by indirect measurement. This discrepancy was not observed in 21 hypotensive patients with low or normal resistance. Infusion of vasoconstrictor drugs into the arm circulation of normal subjects reproduced the clinical situation of normal arterial pressure with absent Korotkoff sounds and diminished radial pulses. High vascular resistance in the upper extremity prevents the hemodynamic events which normally produce the Korotkoff sounds. Disappearance of peripheral pulses is probably the result of reduced stroke volume and increased arterial wall stiffness. (Cohn, J. N.: *Blood Pressure Measurement in Shock; Mechanism of Inaccuracy in Auscultatory and Palpatory Methods*, J.A.M.A. 199: 972 (March) 1967.)

SEPTIC SHOCK A series of young patients with well-defined diagnoses and refractory clinical shock were studied hemodynamically. When conventional methods of therapy failed to correct hemodynamic deficits, phen-

oxybenzamine was administered. The pattern of response suggested that this drug improved cardiac function directly and thereby improved tissue capillary perfusion. Three modes of action appear to be possible: (1) direct inotropic action on the myocardium; (2) vasodilating effect on the coronary vessels and myocardial microvasculature; and (3) relief of postcapillary pulmonary vasoconstriction with increased venous return to the left heart. (Anderson, R., and others: *Phenoxybenzamine in Septic Shock*, Ann. Surg. 165: 3-41 (March) 1967.)

TREATMENT OF SHOCK The authors analyzed the pharmacodynamic actions of isoproterenol and hydrocortisone as these agents affect the heart and peripheral circulation in circulatory distress. Isotonic or hypertonic (30 per cent) dextrose was used as a vehicle and to each 50 ml. 1 mg. of isoproterenol and 200 mg. of hydrocortisone were added. This mixture was given intravenously and within 20 minutes to 120 minutes a stable blood pressure, from 100-120 mm. of mercury was established in 49 to 60 patients so treated. In the patients responding to treatment, the blood pressure prior to therapy could not be obtained in 27, and in 15 patients pressor amines were becoming ineffective. In 6 patients while the blood pressure was maintained by pressor drugs the combination effected a resolution of peripheral cyanosis. This effect on peripheral circulation was noted in 95 per cent of the patients. While the majority of the patients had hypotension associated with circulatory and ventilatory collapse (25), there were a number of other groups treated, i.e., intoxication (16), multiple trauma (8), sepsis (5), and a miscellaneous group (6). The institution of the drug combination was undertaken in most instances after the failure of conventional therapy with blood and plasma expander. Eighty per cent of these patients were also supported by artificial respiration with oxygen in concentrations of no less than 50 per cent. Observations on 12 typical cases are reported in detail. One patient required therapy for 6 days receiving 1,300 mg. of hydrocortisone and 5.2 mg. of isoproterenol. In 8 of 11 patients with acute pulmonary oedema, the oedema disappeared with the drug com-